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(54) UNDERGROUND PIPE OR CABLE MARKER

(71) We, PLYMOUTH FRANCAISE, a French Body Corporate of Feyzin (Rhône) France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to markers which mark the position of buried pipes or cables.

In use the markers are buried in the ground. Markers are known consisting of, for example, metal lattice structures, which may be coated with plastics material, or plastics strips or lattice structures, and fulfil their function perfectly if they are uncovered during the digging of trenches by hand. However, in the case of trenches dug by a mechanical excavator, they do not in fact provide a good indication of the proximity of buried cables or pipes.

These known markers are made from a single component or a single component provided with an anti-corrosion coating of for example plastics material serving only for a protection, and their structure is such that they have a single well-defined breaking stress and a single well-defined elongation at rupture. Due to this, when for example the shovel of a mechanical excavator encounters such an article, it breaks and, in general, the pieces which remain in the ground are hardly visible on the edges of the trench. As regards the piece which has been torn out and which is located in the shovel, it is often buried under earth and is thus not visible.

Markers are also known of the type formed of wire netting having first and second opposite longitudinal edges formed of and reinforced by wires attached to the netting and extending along the length thereof. As an aid to observing a marker of this type during excavation work, a marker has been proposed which when initially laid has an undulating shape. This is achieved by constructing the marker so that the length of marker increases progressively across the width of the marker from the first to the second longitudinal edge

so that the second edge is longer than the first. When the first edge is arranged rectilinearly, the marker is not flat and the undulations are apparent, the size of each undulation being greatest at the second edge and decreasing across the width of the marker towards the first edge.

According to the invention, there is provided an underground pipe or cable marker comprising an elongateable and breakable first longitudinal element in combination with one or more elongatable and breakable second longitudinal elements, the or each second element extending longitudinally along and attached to the first element, and the second element being spaced from the first and second opposite longitudinal sides of the first element or the second elements extending side by side and being spaced one from another and from said first and second opposite sides, said marker being rupturable under the effect of applied force, the arrangement being such that the amount of permanent elongation of the first element in response to the applied force producing the rupture differs from the amount of permanent elongation of the or each second element in response to the applied force producing rupture, and the magnitude of applied force required to break the first element being different from that required to break the or each second element.

Thus, the driver of the mechanical excavator is in a position to detect at least one element of a ruptured marker at the time of its rupture.

This is because, since the first element and the or each second element of the marker exhibit differing amounts of permanent elongation at rupture and forces of different magnitudes are required to break the or each second element and the first element respectively, when the shovel of the mechanical excavator encounters and causes the rupture of the marker, there is always, either on the edges of the trench or extending beyond the edges of the excavator shovel, pieces of the

marker which are readily visible to the excavator driver. Thus the marker fulfills its function.

In an embodiment of the marker formed according to the invention, the first element can take the form of a lattice structure incorporating longitudinally extending members forming the second elements which, even if they have a breaking strength equal to or greater than that of the slanting, i.e. diagonal, lattice members, break first when said lattice structure is gripped by an excavator shovel and hence stretched in the longitudinal direction, due to the fact that the slanting members only break after having been straightened out in the manner of a concertina by the application of further force.

The longitudinally extending members may be made of the same or different materials than those forming the lattice structure proper.

In the case of a diagonal lattice structure, for example, another embodiment of the invention results from the addition to this lattice structure of one or more longitudinal strips which, integral or not with the lattice structure, modify the breaking characteristics thereof.

Thus, particularly in the case of a lattice structure of plastics material, such as polyethylene, the intersections of which are welded, it is possible to add one or more longitudinal strips of another very resistant material, such as drawn polypropylene for example, strips of which may be welded to the lattice structure or may be passed between the mesh or even introduced into sheaths welded longitudinally with respect to the lattice structure.

Two embodiments of the invention will now be described, by way of example, with reference to the accompanying drawing, in which:

Figs. 1 and 2 respectively illustrate relatively short lengths of markers of wire and plastics materials.

The marker illustrated in Fig. 1 comprises a first element formed by a twisted metal wire lattice structure 2, which may be coated with plastics material, and two second elements formed by wires 3 which have been incorporated in the structure 2 at the time of

manufacture and which extend in the longitudinal direction of the structure 2. The wires 3 are spaced apart and spaced from both longitudinal edges of the structure 2. The number of wires 3 can be varied.

In Fig. 2, a lattice structure of plastics material is shown which comprises members 4 welded together at their intersections and two associated longitudinal strips 5. The number of the strips 5 can be varied.

WHAT WE CLAIM IS:—

1. An underground pipe or cable marker comprising an elongatable and breakable first longitudinal element in combination with one or more elongatable and breakable second longitudinal elements, the or each second element extending longitudinally along and attached to the first element, and the second element being spaced from first and second opposite longitudinal sides of the first element or the second elements extending side by side and being spaced one from another and from said first and second opposite sides, said marker being rupturable under the effect of applied force, the arrangement being such that the amount of permanent elongation of the first element in response to the applied force producing the rupture differs from the amount of permanent elongation of the or each second element in response to the applied force producing rupture, and the magnitude of applied force required to break the first element being different from that required to break the or each second element.

2. A marker as claimed in claim 1, in which the first element is a lattice structure, and the second elements comprise wires incorporated in the lattice structure.

3. A marker as claimed in claim 1, in which the first element is a lattice structure, and the second elements are formed by strips attached to the lattice structure.

4. An underground pipe or cable marker, substantially as herein described with reference to Fig. 1 or Fig. 2 of the accompanying drawings.

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FIG. 1

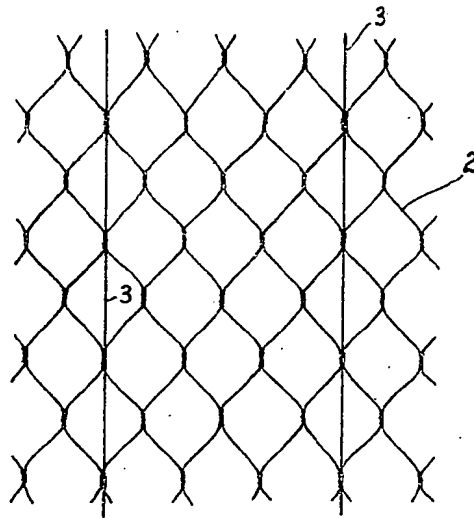


FIG. 2

